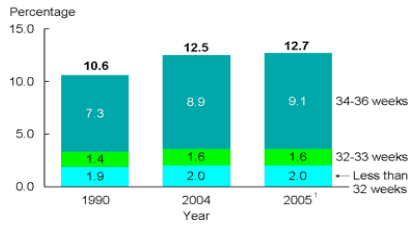
Facilitating Breastfeeding in the Late Preterm (Near-Term) Newborn

Objectives

1. Describe the relationship between the development of coordinated suck-swallow-breathe and the oral behaviors associated with ineffective breastfeeding in late preterm (near-term) newborns.
2. Develop an infant-outcome-based care plan for transition to effective direct breastfeeding.
3. Discuss the role of alternative feeding methods, including breastfeeding aids and devices, in facilitating the transition to effective breastfeeding while achieving appropriate intake for the late preterm (near-term) infant.

Late Preterm Birth Epidemic

Figure 5. Percentage of preterm births: United States, 1990, 2004, and 2005



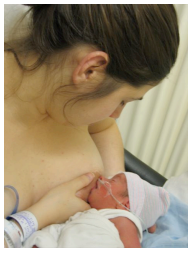
[1] Based on preliminary data.
SOURCE: CDC/NCHS, National Vital Statistics System

Late Preterm(LPT)/Near-Term (NT) Infant

- Defined as infants born:
  - 35 to 36 6/7 weeks gestation
    Wang, et al, 2004
  - 34 to 37 weeks
    (AWHONN, 2005)
  - 34 to 36 6/7 weeks
    (Engle et al & AAP Committee on Fetus & Newborn, 2007)

Clinical Outcomes* RT LPT Birth

- Respiratory distress
- Hypoglycemia
- Temperature instability
- Poor feeding
- ↑ Sleepy
- Clinical jaundice/hyperbilirubinemia
- Infection/sepsis



* ↑ Morbidity with "breastfed at discharge" (Engle et al, 2007)

Focus on Feeding the LPT Newborn

Effective vs. Ineffective Breastfeeding:

Feeding Behaviors & Outcomes

Effective Breastfeeding

NANDA Definition: RT dyad exhibiting *proficiency* and *satisfaction* with the BF process

Defining characteristics:

Diagnostic Cues (evidence-based):

- Effective maternal-infant communication RT:
  - Infant cueing → maternal response
- Mother able to position infant for latch-on
- Sustained suckling/swallowing
- s/s Infant satiety @ feeding
- ↑ Infant weight gain

Effective Breastfeeding

Supporting Cues:

- Normal breast structure
- Normal infant oral structure
- Gestational age >34* weeks
- Infant eagerness to breastfeed
- s/s MER
- Adequate infant output (for day of PP age)
- Maternal knowledge/confidence/support
- Verbalization of satisfaction č BF process

* KG: Evidence does not support this GA for adequate milk transfer

Ineffective Breastfeeding

NANDA Definition: RT dissatisfaction/difficulty with the BF process by a mother or infant

Defining Characteristics:

Diagnostic Cues (evidence-based)/1 or more of:

- ⦸ s/s MER ▪ ↓ Breast emptying
- ↓ Infant ability (to latch)
- ↑ Resistance to latch on/↑ Crying/arching at breast
- s/s ↓ Infant intake ▪ ↓ s/s Infant satiety
- Nonsustained/insufficient opportunity for suckling
- Sore nipples for >1 week
- Actual/perceived ↓ production

Ineffective Breastfeeding

Supporting Cues: History breastfeeding failure

Related Factors:

- Knowledge deficit/anxiety
- Maternal breast anomaly/surgery history
- Interrupted breastfeeding
- Infant prematurity/anomaly
- ↓ Suck reflex
- ↑ Supplemental feedings with artificial teat
- Non-supportive partner/family

Ineffective Feeding Pattern

NANDA Definition: RT inability to begin or maintain effective coordination of sucking, swallowing and breathing

Defining Characteristics:

Diagnostic Cues (evidence-based):

- Defined problem with infant ability to begin or sustain coordinated suck-swallowing-breathe

Ineffective Feeding Pattern

Supporting Cues:

- Breastfeeding not successful
- Non-nutritive suckling only
- ↑ Respiratory effort with feeding activity

Related Factors:

- CNS-related
- Mechanical
- Systemic condition affecting feeding ability

Breastfeeding as the "messenger" vs. THE problem

Interrupted Breastfeeding

NANDA Definition: a break in continuity of the breastfeeding process RT inability/inadvisability to put baby to breast

Defining Characteristics:

Diagnostic Cues (evidence-based):

- Infant not receiving nourishment at breast for some/all feedings
- Maternal desire to maintain lactation & provide her milk for infant's/infants' nutritional needs

Interrupted Breastfeeding

Supporting Cues: Knowledge deficit RT milk expression & storage

Related Factors:

- Maternal-infant separation RT illness of either, prematurity/immaturity, etc.
- Short-term contraindications to breastfeeding
- Need to wean abruptly
- Maternal employment

Implications of…

Ineffective BF or *Ineffective Feeding Pattern*

- Inadequate infant intake
- Dehydration & RT consequences
- Failure to thrive (FTT)
- Milk insufficiency—transient or permanent
- "Failed" breastfeeding/lactation → weaning
- Breastfeeding "blamed" vs. "victim" of other factor
  - Affects maternal & care provider perceptions

Why Do Many Late Preterm Infants Demonstrate Poor Feeding?

The Anatomy & Physiology of Newborn Feeding

Anatomy of Feeding

- The process of feeding requires:
  - 6 +1 Cranial nerves
  - Over 30 muscles
- Swallowing centers:
  - 2 sets of specialized nerve tracts in brain stem
  - Direct movements

Development of Sucking

Developmental Patterns of Suck and Swallow

Postmenstrual Gestational Age (PMGA)	**32-33 weeks**	**33 weeks**	**>34 weeks**
Sucking	Rapid, low amplitude	Irreg deflection 2-3 suck/second	1 suck/sec
Suck/Swallow	Not linked	Not linked	Suck/swallow dyad seen

Adapted from Rogers &Arvedson (2005) as from Gewolb et al (2001)

Oral Feeding Development

26-28 weeks	**29-33 weeks**	**34-37 weeks**
• Suckle immature • Poor oral endurance • Poor state maintenance • Poor coordination • Physiologic variability • Tonic bite reflex	• Stronger suckle • Diminished tonic bite • NNS (≧2 sucks/ sec) for <10 min • Improved physiological stability •Improved state maintenance	• Strong interest in suckling/feeding • Suck-Swallow-Breathe • ≧ 34 Weeks • ↑ Coordination SSB • ↑ Physiological stability; episodes with feeding •NNS &/or NS for ≦20 min

Adapted from: Waitzman KA (2002)

Maturation of Suck-Swallow

Week Gestation	Typical Time for S-S Maturation
32-34	6-8 weeks
33-35	2-4 weeks
34-36	1-2 weeks
36-39	5 days
39+	1-2 days

Adapted from: Palmer MM, 2004

- Immature 3-5 sucks/swallows then breath
- Transitional 6-9 sucks/swallows then breath
- Mature 10-30 suck/swallow/breath cycles

Respiration

- Coordination of breathing & swallowing
  - 32-40 weeks – ↑ Maturation
- 1st week of oral feeding – During 1st 1-2 minutes of continuous sucking phase both PT and FT (bottle-fed) infants experience *decreased*:
  - Minute ventilation – amount of air inhaled in 1 minute
  - Respiratory rate (RR) – number of breaths/minute
  - Tidal volume – size of each breath
- Within 1 month FT infants experience *decreased*:
  - Length of deglutition (swallowing) apnea time
  - Number of multiple swallow events with deglutition apneas

Resting Respiratory Rate (RR)

- Infant's respiratory rate must be slow enough to coordinate with sucking and swallowing
- WNL "breaths per minute" (BPM):
  - Term infant 30-40
  - Preterm infant 40-60
  - Ill infant 60-80
- Most infants are not able to feed with RR of >80 BPM

From: Arvedson J & Lefton-Greif MA (1998)

Breastfeeding LPT Newborns: Range of Behaviors

- Effective Breastfeeding
  - ↑ Likelihood of frequent feeding – >10/24 hours
- Ineffective Breastfeeding RT immature CNS
  - ↑ Sleepy = ↓ Alerting/Cueing to feed
  - ↓/⊘ Latch
  - ↓/⊘ Suckling ➔ Wake, latch, drift to sleep <2-3 min
  - ↓/⊘ Sustained suckling

LPT Breastfeeding Assessment

Infant able to latch & demonstrate suckling

- Early, frequent breastfeeding
  - ≥8-10/24 hours for >5-10 minutes
- Self-regulation R/T state behavior needed for feeding
  - Waking
  - Alerting/cueing
- Rooting/seeking – cueing behaviors
  - ↑ Tension
  - Hands-to-face/mouth
  - Fussing

LPT BF: Nutritive Suckling (NS) versus Non-Nutritive suckling (NNS)

NS pattern

- 1 suck/second
- Deep, rhythmic jaw drops
- WNL RR
- Sustained >5 minutes
- WNL pauses

NNS pattern

- ≥2 sucks/second
- Inconsistent jaw drops
- s/s ↑ Respiratory effort
  - Nasal flaring
- Unsustained
- ↑ Frequent/long pauses

Facilitating Breastfeeding

- Rooming-in = ↑ access
- ↑ Kangaroo Mother Care (KMC)
- Ongoing assessment & maternal education RT:
  - WNL Waking, alerting, cueing
  - Latch-on & sustained nutritive suckling >5 minutes
  - Adequate outputs for day postpartum
  - s/s Associated issues, e.g. jaundice
  - WNL weight loss & regaining by end of 1st week
  - Re-assessment RT outcomes
- "If it ain't broke"…leave exclusive breastfeeding alone!

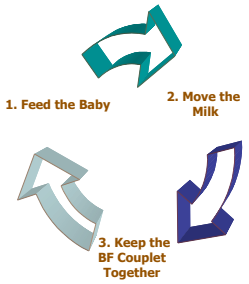
Ineffective Breastfeeding

Intervening for Late Preterm Disorganized Suckling

When the Goal is Long-Term Breastfeeding

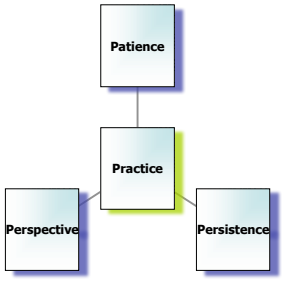
Normalizing Infant Feeding

- Respect baby's oral cavity
- Respect/protect couplet's right to a breastfeeding relationship
- Follow Rules 1, 2, 3
- Provide for follow-up and referral to:
  - Outpatient IBCLC
  - Mother Support Group



Rule #1: Feed the Baby

- "Tincture of time"
  - RT ↑ maturity
    - CNS
    - Structural
  - "Practice" breastfeeds
    - ≤15 minute duration
- ↑ Caloric intake
  - How? = Alternative feeding
    - ↓ Interference with BF



Alternate Feeding Methods

- View as "interventions"
  - Medically necessary
  - Maternal/parental *informed* choice
- Identify the problem before choosing device(s)
  - Physical
  - Psychosocial

Best Alternative Feeding Method

- Selection allows for:
  - ↑ Progression to breastfeeding
  - Ease RT appropriate use of device
  - Adequate ongoing milk expression
  - Maternal/parental willingness/ability to use
- ∅ Evidence-based method RT improved breastfeeding outcomes

Feeding Aids/Devices

- Be able to discuss benefits vs. risks of devices
  - Direct breastfeeding – Nipple shield, "at breast" tube
  - Non-invasive devices: cups, spoons, syringes
  - Invasive devices
    - Tubes – Finger-feeding; nasogastric
    - Artificial nipples (bottles)
- ⦸ Evidence-based "best" device

Nipple Shield

- ↑ Infant oral organization
  - Improve latch
    - Provide ↑ oral structural stability
  - ↑ Sustained nutritive suckling
    - ↑ Stimulation to palate
    - ↓ Habituation
  - ↑ Maternal hopefulness
- Risk (?) – Shield dependency

Interventions: "At Breast" Devices

- Feeding tube at breast
  - Infant must be able to:
    - Latch (attach at breast)
    - Suckle (transfer milk)
  - Maternal comfort with method
  - Risk – Tube-feed vs. breastfeed

Other Feeding Devices

- Cup-feeding
  - Safe
  - ↑ Loss from mouth (?)
  - ↓ Intake
- Syringe, spoon, eye-dropper
  - Time-consuming
  - ↓ Intake
- Finger-feeding
  - Skin-covered digit ≠ breast
  - ⦸ Evidence RT suck "training"

From: WHO/UNICEF (1993). *Breastfeeding counseling: A training course*. Geneva, Switzerland

Bottle-Feeding

- Bottle ➔ ↑ faster feeding method RT:
  - ↑ Feeding-nipple flow rate
  - ↑ Accessible
- ↑ Risk of S-S-B difficulties = ↓ O_2 saturation
- ↑ Interference with BF oral behaviors RT:
  - ↑ Flow control
    - Feeding technique
    - Teat/nipple
  - Alterations in suck(ling)
- YET…Breastfeeding & Bottle-feeding ≠ Mutually Exclusive

Physiologic Bottle-Feeding: Simulate BF Behaviors

Positioning – semi-upright

Appropriate bottle teat
- ↓ Flow rate (5 - 6ml/min)

Latch-on
- Trigger rooting/wide gape

Take advantage of pauses

Outcomes
- Timing/Length of feed
  - ≥5 min/oz (30ml)
- *Stress cues* re: flow rate
  - *Obvious* – gagging, choking, sputtering, coughing
  - *Subtle* –nasal flaring, clenching/biting, ↑ drooling

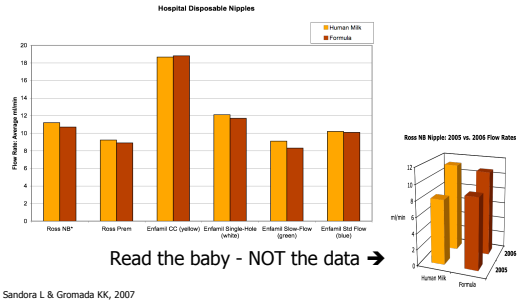
Bottle-Feeding Technique

1. Positioning

2. Simulating Breastfeeding Latch

3. Observe Infant Response

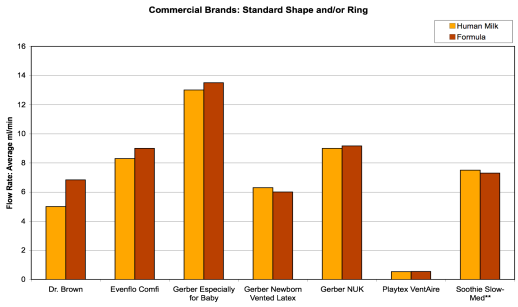
In-Hospital, Disposable Nipples



Read the baby - NOT the data ➔

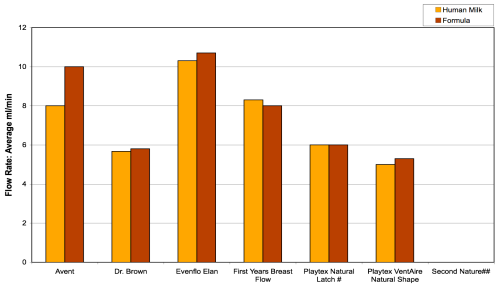
Sandora L & Gromada KK, 2007

Commercial Bottle Nipples: Standard



Sandora L & Gromada KK, 2007

Commercial Bottle Nipples: Wide-Ring



Sandora L & Gromada KK, 2007

Rule #2: Move the Milk

- Milk expression/movement is crucial WHENEVER:
  - Baby has disorganized or dysfunctional sucking
  - Alternative/supplementary feedings are necessary
- If baby is not YET able to remove milk adequately, milk still *must* be removed!
  - Move it or lose it!

Initiating Milk Production

- *Rental* hospital-grade, electric pump
- Double collection kit
  - Breast massage before/during pumping sessions
  - Properly fitted breast shields/flanges
- Assess for physical/psychosocial barriers:
  - Adequate number pumping sessions
  - Achieving adequate milk volume

Ongoing Pumping

- Reinforce & provide perspective re:
  - Milk production physiology
  - Benefits for infant and mother
  - Short-term time investment
- Make it easier
  - Revise pumping plan RT maternal "reality"
    - Cluster/"power" pump
    - Night pumping sessions with night waking
  - Hands-free pumping

Document Sessions!

Bethesda North Good Samaritan TriHealth

Weekly Breast Pumping Log for Full Breastmilk Production

By 10-14 days postpartum, the amount of milk you should obtain with a breast pump in 24 hours:

Ideal: 750-1000ml (25-33oz)
Borderline: 350-500ml (11.5-16.5oz)
Low: less than 350ml (less than 11.5oz)

Day of Week: D a te:

Session	1	2	3	4	5	6	7	8	9	10
Time										
Minutes										
Amount	R / L	R / L	R / L	R / L	R / L	R / L	R / L	R / L	R / L	R / L

Comments: _____

Day of Week: D a te:

Session	1	2	3	4	5	6	7	8	9	10
Time										
Minutes										
Amount	R / L	R / L	R / L	R / L	R / L	R / L	R / L	R / L	R / L	R / L

Comments: _____

Rule #3: Keep the Couplet Together

- Kangaroo Mother Care (KMC)
  - Mother-infant skin-to-skin contact
    - ↑ Infant system organization
    - ↑ State regulation
    - ↑ Sensitivity to infant feeding cues
      - Infant-led latching
      - Infant-led breastfeeding progression
    - ↑ Milk production
    - ↑ Maternal-infant attachment
    - "Normalizing" behavior

Infant-Led Progression

NO rule re: "Must achieve direct breastfeeding by…"

Infant-Led Transition

Kangaroo Care

↓

Nuzzling

↓

↑"At Breast" R/T Cues, Nutritive Suckling

↓

EBM-feeding p.r.n.

↓

Milk expression

Ineffective ➔ Effective Breastfeeding

- ↑ Mother-infant(s) skin contact (KMC)
- ≥ 10-12 BF/baby
  - Cue-based Breastfeeding
  - "Babymoon" – Round-the-clock breastfeeding
- ↓ Amount/alternative feed p.r.n.
- Monitor infant outcomes RT intake
  - Urine/stool output
  - Test-weighing/daily weights p.r.n.
- Compensatory milk expression p.r.n.

Ineffective ➔ Effective Breastfeeding

Mother may need help understanding outcome differences between WNL exclusively breastfed infant and previously supplemented LPT infant re:

- Typical number/length of feedings
- Interplay of milk removal and milk production